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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/652,660	08/28/2003	Harukazu Watanabe	1232-5123	1886

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EXAMINER	
GARCIA, LUIS	

ART UNIT	PAPER NUMBER
2613	

DATE MAILED: 09/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/652,660	WATANABE, HARUKAZU	
	Examiner	Art Unit	
	Luis F. Garcia	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 August 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *August 28, 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. **Claim 8, 11 and 14-15 are rejected** under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. claim 8 ln4, claim 11 ln4, claim 14 ln5 and claim 15 ln5: "the light beam having...", it is unclear which light beam is being referred to, e.g. first light beam or the second light beam.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. **Claims 1-18 are rejected** under 35 U.S.C. 103(a) as being unpatentable over Korevaar (US 5,777,768).

Regarding claim 1, Korevaar discloses a free space optics communication apparatus **(FIG. 3)** which performs communication with another apparatus with light beams **(FIG. 3 (26a,b,c-transmitter, 34-receiver) in which the transmitters communicate with another apparatus (e.g. receiver) via light beams (20a,b,c))**, comprising:

a plurality of light-emitting units **(FIG. 3 (26a,b,c-transmitters))**, each of the units emitting a light beam which forms a generally elliptical irradiation pattern on the other apparatus **(FIG. 3 (26a,b,c-trasnmitters) and col8 ln7-8 in which the transmitted beams (20a,b,c) irradiate a generally elliptical pattern on the receiver (other apparatus))**, wherein the plurality of light-emitting units are set such that irradiation patterns of light beams from at least two of the plurality of light-emitting units partially overlap at a light-receiving unit of the other apparatus **(col6 ln16-22/col9 ln29-36 in which the emitted light beams overlap at the receiver in order to reduce signal fluctuations)**. Although not expressly disclosing the claimed width ratio of the combined overlapping beams, Korevaar does expressly state:

> "Further, it is important that all of the laser beams 20 which emanate from separate spatial locations in terminal 12 overlap in the far field 30 to achieve a reduction in signal fluctuations at the receiver 34 in terminal 14. Thus, the

required power of each laser transmitter 26a-c is reduced by far more than would be expected from just summing the output powers." (col6 ln16-22)

"In the above disclosure, there has been mention of the divergence of the laser beams 20 as they emanate from a terminal 12, 14. The importance of this divergence is, of course, based on the intention of the system 10 that all of the laser beams 20 overlap in the far field 30. This divergence and overlap, however, can not be haphazard. For the present invention, these characteristics of the laser beams 20 must be somehow controlled and, therefore, made predictable." (col9 ln29-36)

"Also important, however, is the fact that the diffuser 104 establishes a divergence for the individual beams 20, 20b, 20c' and 20c'' which will cause them to overlap in the far field" (col10 ln4-6)

Therefore, Korevaar provides a clear suggestion that the amount of overlap (width ratio) of the combined transmitted light beams are to be determined via routine experimentation, in order to arrive at the stated goal of controlled and predictable overlap of laser beams which reduce the signal fluctuations in the receiver as seen in FIG. 1. Per MPEP 2144.05, one finds:

"A. Optimization Within Prior Art Conditions or Through Routine Experimentation Generally, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges

by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955) (Claimed process which was performed at a temperature between 40°C and 80°C and an acid concentration between 25% and 70% was held to be prima facie obvious over a reference process which differed from the claims only in that the reference process was performed at a temperature of 100°C and an acid concentration of 10%.); see also Peterson, 315 F.3d at 1330, 65 USPQ2d at 1382 ("The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages."); In re Hoeschele, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969) (Claimed elastomeric polyurethanes which fell within the broad scope of the references were held to be unpatentable thereover because, among other reasons, there was no evidence of the criticality of the claimed ranges of molecular weight or molar proportions.). For more recent cases applying this principle, see Merck & Co. Inc. v.Biocraft Laboratories Inc., 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), cert. denied, 493 U.S. 975 (1989); In re Kulling, 897 F.2d 1147, 14 USPQ2d 1056 (Fed. Cir. 1990); and In re Geisler, 116 F.3d 1465, 43 USPQ2d 1362 (Fed. Cir. 1997).

B. Only Result-Effective Variables Can Be Optimized

A particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977) (The claimed wastewater treatment device had a tank volume to contractor area of 0.12 gal./sq. ft. The prior art

did not recognize that treatment capacity is a function of the tank volume to contractor ratio, and therefore the parameter optimized was not recognized in the art to be a result-effective variable.). See also In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980) (prior art suggested proportional balancing to achieve desired results in the formation of an alloy).

Korevaar has recognized that the amount of overlap (e.g width ratio of combined overlap) as a variable which achieves the recognized result of reduction in signal fluctuations. Therefore, the determination of the optimum range of width ratio overlap of the combined transmitted light beams is properly characterized as obvious subject matter characterized by routine experimentation by those of ordinary skill in the art.

Regarding claim 2, rejected as stated in claim 1 rejection.

Regarding claim 3-4, rejected as stated in claim 1 rejection in which at least two light beams overlap at the receiver in order to reduce the signal fluctuations at the receiver.

Regarding claim 5, Korevaar discloses the free space optics communication apparatus according to claim 1 as applied above.

Korevaar further discloses wherein each of the light-emitting units includes a light source and an optical system which condenses light emitted from the light source **(FIG. 8 (26c-transmitter, 66c-focusing optics) in which the light emitting units (transmitters) include focusing optics (optical system which condenses light))**.

Regarding claim 6, Korevaar discloses the free space optics communication apparatus according to claim 1 as applied above.

Korevaar further discloses wherein the light source is a semiconductor laser **(col8 ln7-8 in which the light source is a diode laser (semiconductor laser))**.

Regarding claim 7, rejected as stated in claim 1 rejection in which the other apparatus is a receiver (light-receiving unit).

Claims 8-14 addressed below.

Regarding claim 15, Korevaar discloses a communication system which performs communication with light beams **(FIG.3)**, comprising:

a transmission apparatus which includes a first light-emitting unit and a second light-emitting unit each emitting a light beam **(FIG.3 (26a,b,c-trasnimtters, 34-receiver) in which the transmission apparatus (e.g. 27O) transmits information to the receiver through light beams (20a,b,c))**, the light beam having a cross section of generally elliptical shape **(col8 ln7-8 in which the diode laser used in the transmitters have a generally elliptical cross section/shape)**, and

a reception apparatus which includes a light receiving unit which receives the light beams from the first light-emitting unit of the transmission apparatus and from the second light-emitting unit of the transmission apparatus **((FIG.3 (26a,b,c-transmitters, 34-receiver) in which the first and second transmitted light beams (20a,b,c) are received by receiver-34)**. Although not expressly disclosing the claimed incline of the transmitter(s) by an angle smaller than the angle of divergence, Korevaar does expressly state:

> "These laser transmitters 26a-c are pointed by respective steering assemblies 28a, 28b and 28c, also mounted on support member 27a, so that the

respective emanating laser beams 20a, 20b and 20c are all pointed approximately in the same direction. For purposes of the present invention the laser beams 20a, 20b and 20c are all pointed along substantially parallel paths, recognizing that in the far field 30 they will, at least to some extent, overlap one another." (col5 ln22-30)

"The respective steering assemblies 28a-c can be either independent gimbals which are useful for steering the laser transmitters 26a-c separately,..." (col5 ln32-34)

Therefore, Korevaar provides a clear suggestion that the amount of inclination provided to each transmitter is controlled via respectively transmitter gimbals, in order to arrive at the stated goal of overlapping the laser beams in order to reduce the signal fluctuations in the receiver. Per MPEP 2144.05, one finds:

"A. Optimization Within Prior Art Conditions or Through Routine Experimentation Generally, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955) (Claimed process which was performed at a temperature between 40°C and 80°C and an acid concentration between 25% and 70% was held to be prima facie obvious over a reference process which differed from the claims only in that the reference process was performed at a temperature of 100°C and an acid concentration of 10%.);

see also Peterson, 315 F.3d at 1330, 65 USPQ2d at 1382 ("The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages."); In re Hoeschele, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969) (Claimed elastomeric polyurethanes which fell within the broad scope of the references were held to be unpatentable thereover because, among other reasons, there was no evidence of the criticality of the claimed ranges of molecular weight or molar proportions.). For more recent cases applying this principle, see Merck & Co. Inc. v.Biocraft Laboratories Inc., 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), cert. denied, 493 U.S. 975 (1989); In re Kulling, 897 F.2d 1147, 14 USPQ2d 1056 (Fed. Cir. 1990); and In re Geisler, 116 F.3d 1465, 43 USPQ2d 1362 (Fed. Cir. 1997).

B. Only Result-Effective Variables Can Be Optimized

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Korevaar recognizes that the transmitter inclination is a variable controlled by respective steering gimbals. Therefore, the determination of the optimum range of a respective transmitter's inclination is properly characterized as obvious subject matter by routine experimentation by those of ordinary skill in the art.

Regarding claim 8-11, 13, 14 and 16, rejected as stated in claim 15 rejection.

Regarding claim 12, rejected as stated in claim 15 rejection in which the inclination of the transmitters (e.g FIG. 4B (40a-p)) are controlled by steering gimbals; thereby, allowing for an inclination between two shorter diameter directions to be generally 90 degrees, e.g. FIG. 4B in which the shorter diameter direction of light beam from 40a will be inclined generally 90 degrees with respect to the shorter diameter direction of light beam from 40e.

Regarding claim 17, rejected as stated in claim 15 rejection in which the transmitters (FIG. 4B (40a-p)) are controlled by steering gimbals; thereby, allowing the third transmitter (40m) to have a different optical axis then the fourth transmitter (40i); furthermore, allowing the third transmitter light beam (40m) to be orthogonal to the fourth transmitter light (40i).

Regarding claim 18, rejected as stated in claim 15 rejection in which the transmitters (FIG. 4B (40a-p)) are controlled by steering gimbals; thereby, allowing the third and fourth transmitters to have short side direction different from each other and different from the first and second transmitters, e.g. first transmitter-40c, second transmitter-40g, third transmitter-40k and fourth transmitter-40o in which all have a different short side direction.

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luis F. Garcia whose telephone number is (571)272-7975. The examiner can normally be reached on 8-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken N. Vanderpuye can be reached on (571)272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LG

KENNETH VANDERPUYE
SUPERVISORY PATENT EXAMINER